An Application of Geospatial Information Systems (GIS) Technology to Anatomic Dental Charting

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Abstract
Historically, an anatomic dental chart is a compilation of color-coded symbols and numbers used within a template, either paper or computerized, to create a graphic record of a patient's oral health status. This poster depicts how Geospatial Information System (GIS) technology can be used to create an accurate, current anatomic dental chart that contains detailed information not present in current charting systems.

Methods
Anatomic dental charting is generally performed during a patient's initial visit to a dentist. The chart contains outlines of the shapes of teeth, circles, or other shapes to represent each tooth, onto which dental fillings or other restorations are traced, using different colors or patterns for different materials.(1) The chart may or may not be updated as treatment progresses. In addition to providing information to the patient's dentist, this information is becoming increasingly more important in forensic examinations and also to anesthesiologists who require up-to-date dental information before intubation is performed.(2) Some current computerized anatomic charting systems allow the entry of detailed information regarding restorations placed in teeth. However, these systems generally use forms that only show a standard, idealized dentition. Using our method, it is possible to annotate photographic images of the patient's dentition, and thus provide a much closer visual representation of the clinical situation. . We employ Geospatial or Geographic Information Systems (GIS) technology, which allows attributes to be assigned to specific regions in graphic or photographic images. This technology is suitable for a dental chart, as the teeth and restorations can be designated by specific colors or textures, and they can be traced over intraoral photographs or just drawn freehand. Information that is not present in current anatomic dental charts can also be entered, such as: brand name or composition of restorative material used, reason for placement or replacement, complications encountered, dentist's name, etc. Also, the mixed dentition and malpositioned teeth can be represented easily, as well as fixed and removable prostheses. Queries can be performed easily, such as the display of all similar restorations, restorations placed within a certain time period, or restorations placed by the same dentist. GIS technology would allow for a current, accurate anatomic dental chart that can be printed and given to the patient, or transmitted electronically to those individuals requiring such information.

1. Jaroski-Graf J. Dental charting : a standard approach. South Africa ; Albany: Delmar Publishers; 2000.
2. Gatt SP, Aurisch J, Wong K. A standardized, uniform and universal dental chart for documenting state of dentition before anaesthesia. Anaesth Intensive Care 2001;29(1):48-50.